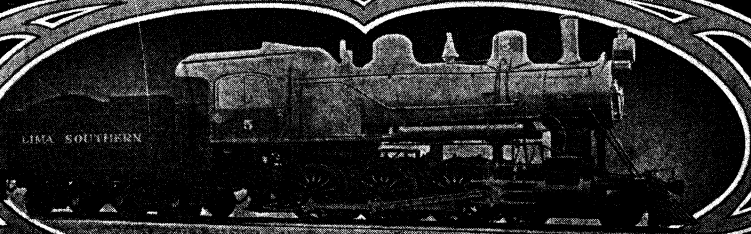
First Logging road 1632
Bf 3

MARCH, 1911

THE LOCOMOTIVE WORLD

LOGGING · MINING · INDUSTRIAL & STANDARD RAILROAD · PLANTATION · MOTIVE POWER

HORSE SHOE CURVE LOGGING RAILWAY, PARDEE & CURTIN LBR. CO., CURTIN, W. VA



High Daily Averages

in skidding depend principally on the initial capacity of the skidder, and the degree to which it can be operated to that capacity. The

Clyde Self-Propelling Steam Skidder

is absolutely independent of loading and because it is never "held back," its full capacity cannot be interfered with by any loading conditions that may exist.

Full capacity, therefore, is always possible when the conditions in the woods are favorable and the hauls are short, thus insuring a constant surplus of logs for the loading crew to compensate for those days when conditions are unfavorable and the hauls are long.

Therefore, with a surplus of logs always ahead of the independent and separate loading unit, the loading crew may also be pushed to its fullest capacity at all times, thus assuring a uniform daily flow of logs to the mill.

Because it is self-propelling, the **Clyde Skidder** can move frequently without loss of time and its special steam guying device facilitates "setting" in the least possible time.

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McGiffert and Decker Patent Self Propelling Steam Logging Machinery

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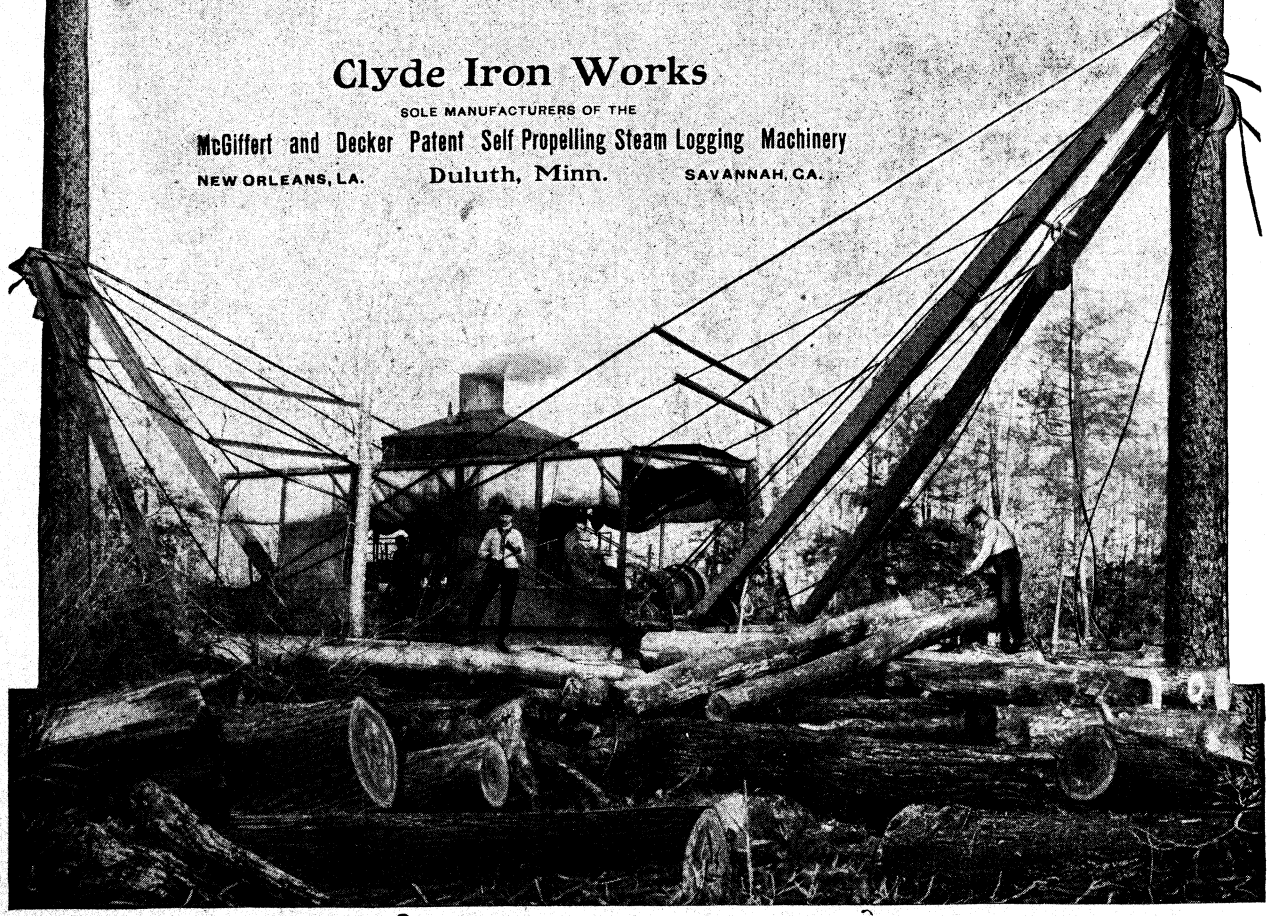

VOLUME 3 MARCH, 1911 NUMBER 11

THE LOCOMOTIVE WORLD.

PUBLISHED MONTHLY BY

THE FRANKLIN TYPE AND PRINTING COMPANY

H. C. HAMMACK, EDITOR

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ONE REASON FOR LOCOMOTIVE FAILURES ON PRIVATE RAILROADS.

STRANGE as it may seem, many of the rod locomotives in use on the private railroads are either old locomotives from trunk line railroads, which have been displaced by modern machines, or locomotives built from old designs and patterns. Not until recently have private users been led to see their mistakes in buying such equipment. Builders who have made a specialty of making locomotives for the private railroads have convinced the purchasers that locomotives, like everything else in the machinery line, have to be built for the work for which they are intended to do; that a locomotive which is properly designed for service on our trunk line railroads is not always a good model for them to pattern after.

Another feature, locomotives of proportions which were used twenty-five years ago, will not do now. One of the most frequent causes for locomotive failures is inefficient heating surface. The boiler of the locomotive is its most important part, and therefore, great care should be exercised by the builder to see that it is of sufficient size to supply an ample amount of steam for the cylinders working at their maximum. The purchaser should be careful to caution the builder to give plenty of steaming capacity. If the writer was to tell you that it is possible to build a locomotive with certain size cylinders, also proper weight on the drivers to give a fairly good factor of adhesion and at the same time have a boiler without sufficient heating surface, some of you might say at first "you are mistaken, it cannot be done." However, if you will stop and reason a little with yourself, you may see where this is possible. For instance, take a consolidation locomotive having correct proportions for a 17x24 and try to make an 18x24 out of it. Suppose the weight on the drivers of the 17x24 engine is 98500 lbs., has 180 lbs. boiler pressure, 51¾" extended wagon top boiler with 1412 square feet total heating surface, 48" drivers. If you change the cylinders to 18x24 the tractive power would be 22110 lbs.; by taking the

weight on drivers and dividing it by the tractive power you will find that the factor of adhesion is 4.45. Thus, you will see that the factor of adhesion is all that can be expected of an engine of this type, but that is not all. The ratio of heating surface to cylinder volume must be taken into account to determine whether the steaming capacity of the engine is sufficient. We will then see what this amounts to whether the steaming capacity of the engine is sufficient. The cylinder volume of the two 18x24 cylinders is 7.06 cubic feet. The total heating surface as we formerly found is 1412 square feet and this divided by the cylinder volume will give the number of square feet of heating surface to each cubic foot of cylinder volume, in other words the ratio of H. S. to C. V. which is 199 to 1. When we consider this ratio which we have obtained, we note that it is not sufficient to make a satisfactory steaming engine. There is not heating surface enough to make a good all around switching engine, although it might do fairly well for switching service. Some one might say, increase your heating surface, you can do that without materially effecting the weight. This is a false idea, as the only way to increase the heating surface enough to do any good would be to enlarge the boiler. When you increase the size of the boiler you raise the weight. This increase is not small, but considerable. This fully demonstrates that a purchaser cannot place certain limitations on the construction of a locomotive and then expect to receive a machine which will give complete satisfaction. Purchasers would do well to put up to the builder the conditions which they have to meet and allow him to furnish an engine which could be guaranteed to perform the work. Too often the purchaser specifies certain dimensions which affects the operation of the locomotive, not realizing the trouble which is bound to come.

CROSS-TIES PURCHASED IN 1909

The government report just issued states that the total number of wooden cross-ties purchased by the steam and electric railroads of the United States in 1909 was 123,751,000. This represents an increase of 11,285,000 ties, or 10 per cent over the number purchased in 1908, but a decrease of 29,952,000, or 19.5 per cent from the number reported for 1907. The year 1907 was one of great activity in the railroad world, while in 1908 the railroads felt the effect of the general business depression and curtailed their expenses accordingly. From a comparison of the figures for 1909, 1908 and 1907, it is evident, however, that the cross-tie industry is rapidly regaining the prosperity enjoyed in 1907.

The figures covering the ties purchased for new track are likewise significant of improvement. Nearly 16,437,000 ties, or 13.3 per cent of the total number, were reported as purchased for new track in 1909, whereas in 1908 only 7,431,000 ties, or 6.6 per cent of the purchased, were for this use. In 1907 the number was 23,557,000, or 15.3 per cent of the total. Of the ties bought for new track in 1909, the steam railroads reported 13,822,000, or about 84 per cent and the electric roads 2,615,000. The ties purchased for new track by steam roads formed 12 per cent of all ties purchased by them, while the corresponding proportion for the electric roads was 31.4 per cent. The steam roads, however, showed by far the larger relative gain over 1908 in this respect, since their building activities were restricted during the latter year to a greater extent than was the case with the electric lines.

TREATING TIES.

Of the cross-ties purchased in 1909, 22,033,000 were given a preservative treatment. This number is 1,743,000 less than that reported for the previous year, but 2,177,000 greater than that for 1907. The proportion which treated ties formed of the entire number purchased was 17.8 per cent in 1909, 21.1 per cent in 1908, and 12,9 per cent in 1907. Of the number treated in 1909, about one-third were treated before purchase and two-thirds after purchase.

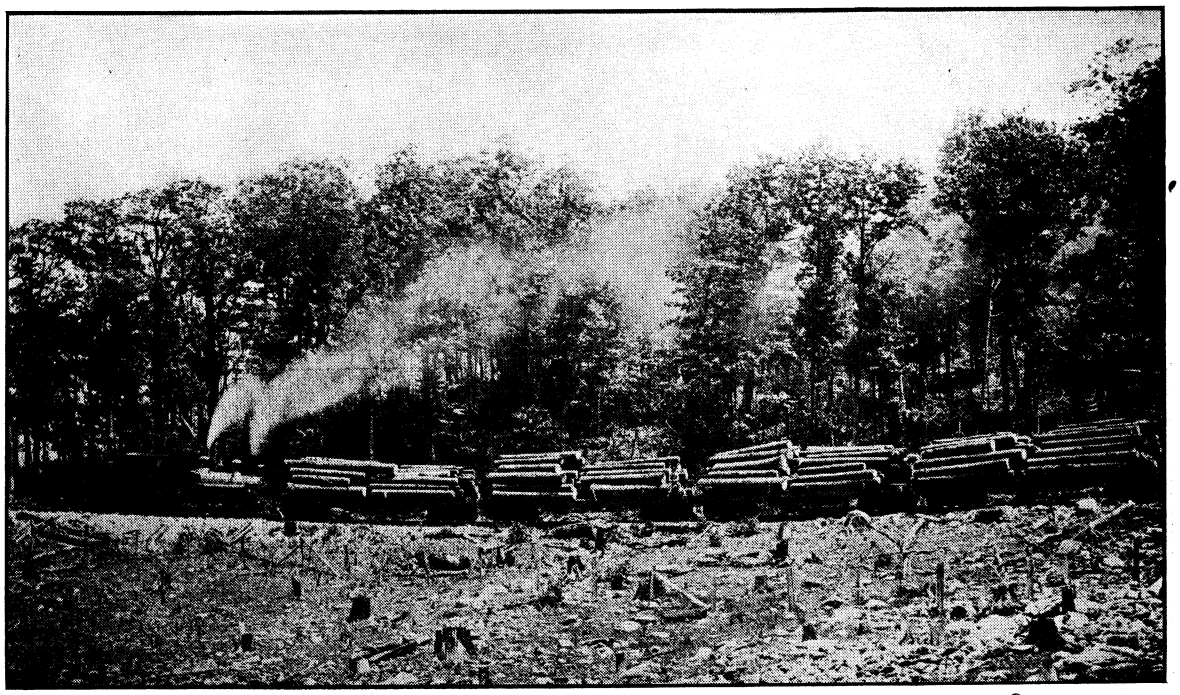
The steam railroads treated more ties after purchase in 1909 than in 1908 or 1907, although the total number of treated ties reported by them was 1,959,000 less in 1909 than in 1908. The number purchased by them already treated was 3,485,000 less than in 1908. The electric railroads reported 835,000 treated ties, of which 582,000, or 69.7 per cent were treated before purchase and 253,000, 30.3 per cent after purchase.

There are now more than 70 wood-preserving plants in the United States. A number of the large steam roads possess expensive plants fitted to handle large quantities of timber in a very efficient manner. Nearly all treated cross-ties used by steam railroads are treated in closed cylinders permitting the application of pressure and designed to secure a heavy absorption of the preservative. The principal preservatives used were creosote oil, and, to an almost equal degree, a solution of zinc chloride. Many ties are treated with an emulsion of creosote oil and a solution of zinc chloride, and one road treated large quantities of its ties with a heavy injection of crude petroleum. Other preservatives were also used.—*Railway Journal.*

THE LOGGING RAILWAY

ACCORDING to the best information which can now be obtained from histories and old documents recorded, the beginning of lumbering, as an industry in America, started in Maine. It is stated that the first sawmill, of which the date is certain, was erected in the old town of York, Maine, in the year 1623. The second was erected on Salmon Falls River, in what is now South Berwick Township, Maine, in 1631 or the year following.

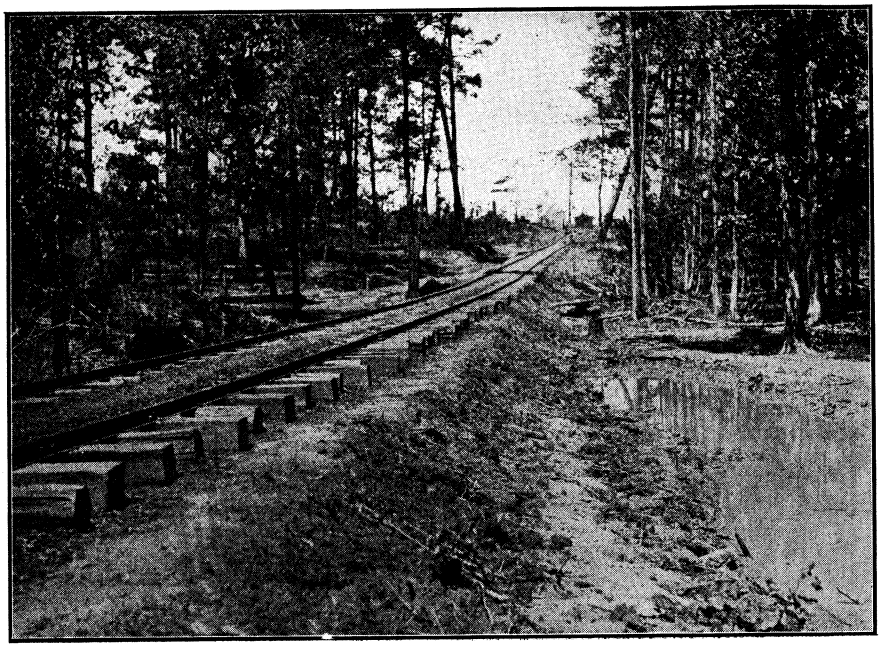
The first railroad in Maine, and among the earliest in the United States, was built in 1832 by Gen. Samuel Veazie to haul timber from Oldtown mills to Bangor. The rails were of wood, strapped with iron, and the locomotive was built in England by Stephenson. This was no doubt the beginning of the "Logging Railway" in the United States. Notwithstanding the fact that the logging railway was employed as a method of transportation of timber as early as 1832, it did not come into general use until along about the year 1880. Prior to this last date mentioned, lumbering was done with teams of oxen in the woods and logs were hauled to the streams by horses when they were floated either to market or to mill locations where they were sawed into lumber.



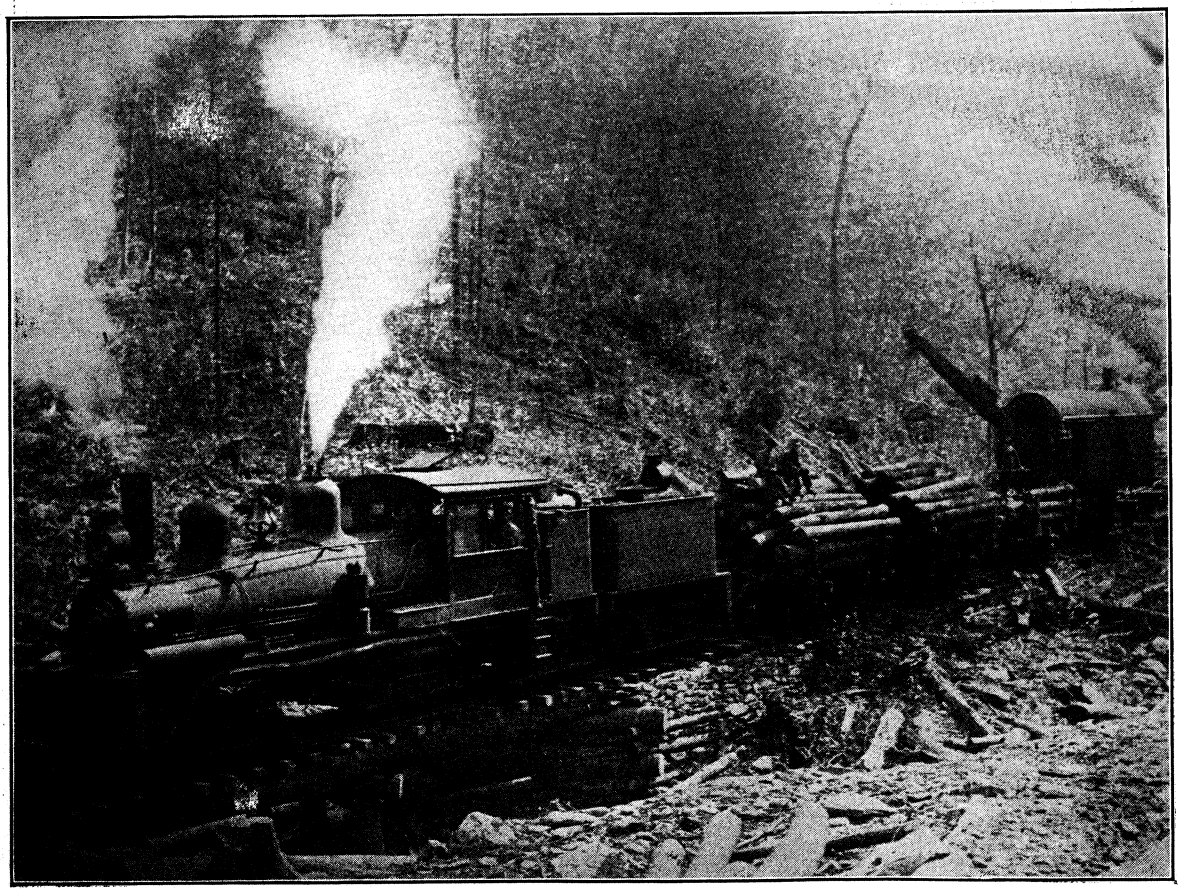
LOGGING RAILWAY OF UNITED STATES SPRUCE LUMBER CO., MARION, VA.
KNOWN AS VIRGINIA SOUTHERN RAILWAY

Lumbering was mostly done along streams or in timber easily accessible to the streams where same could be rafted down streams to market as in those days there were only few railroads throughout the country. Along about 1870 the era of building tram roads into denser parts of the forest and along valleys where the timber was easily gotten from the hillsides, dawned upon the energetic lumbermen. These roads were usually made of material at hand. The foundations were of logs, upon which were laid crossties of planking, for rails then were spiked ribbons sawed from hard maple timber, over which the cars of logs were hauled by horses and mules. These were fairly satisfactory until the neccessity for rails of iron and steel occasioned by reason of the employment of locomotives to pull the cars instead of mules and horses.

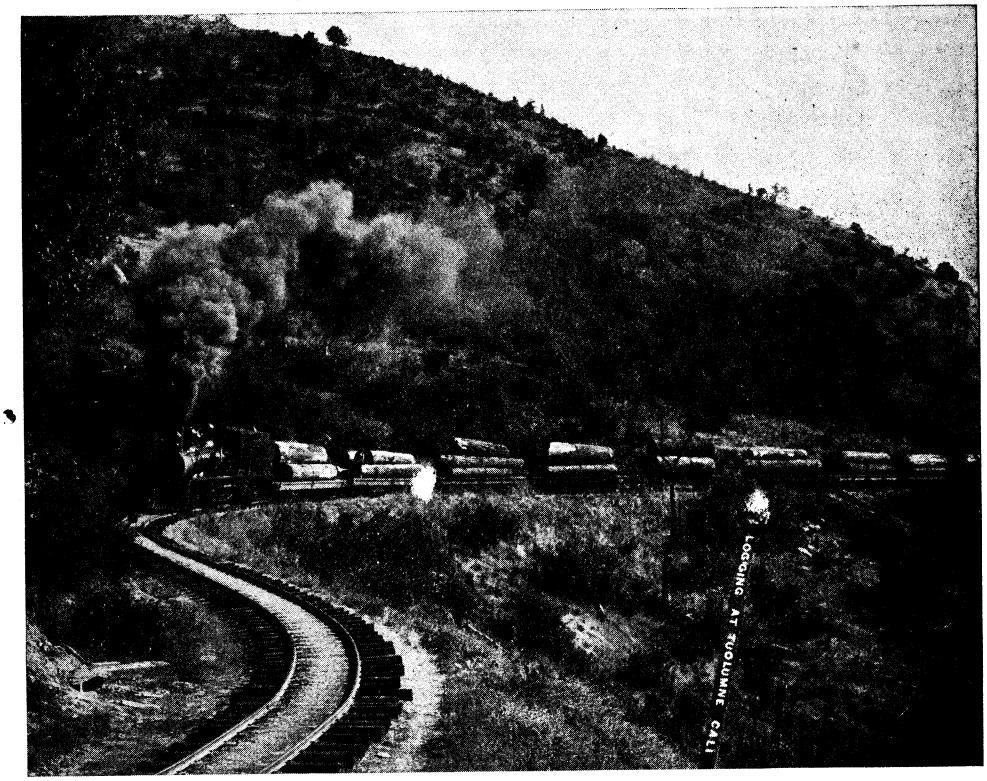
Among some of the first operators to employ the use of the logging railway and locomotives



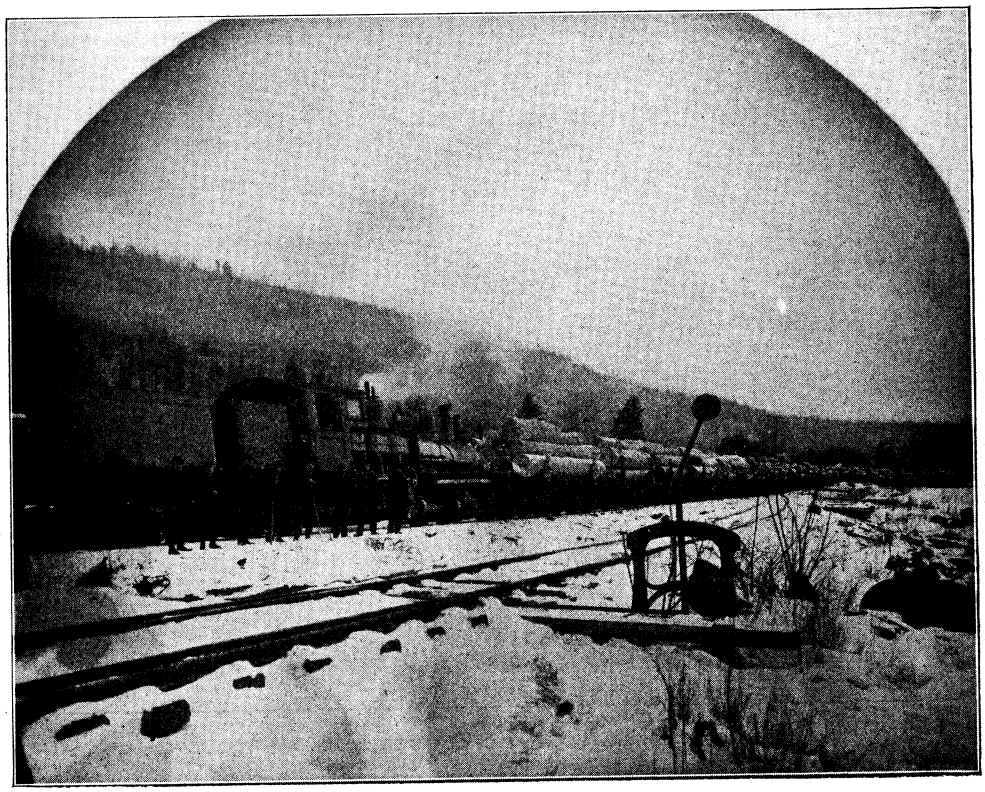
LOGGING RAILWAY BUTTERFIELD LUMBER CO., NORFIELD, MISS.



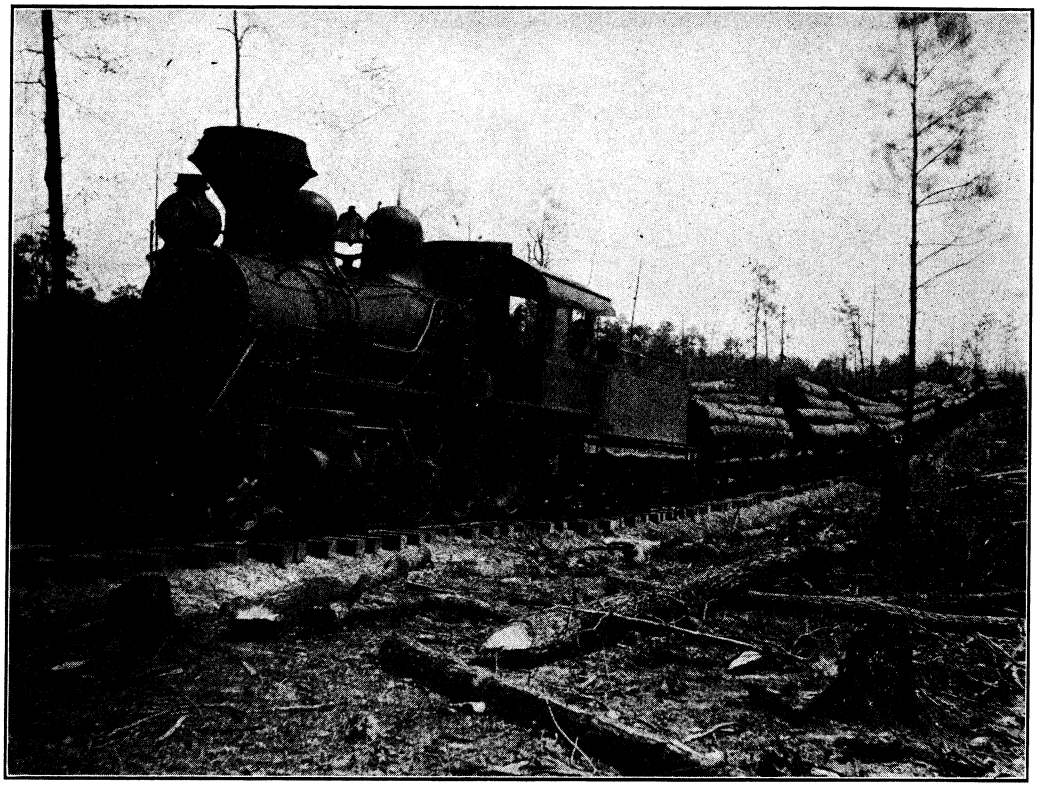
LOGGING RAILWAY, BABCOCK LUMBER CO., ASHTOLA, PA., 9 1-2 PER CENT GRADE



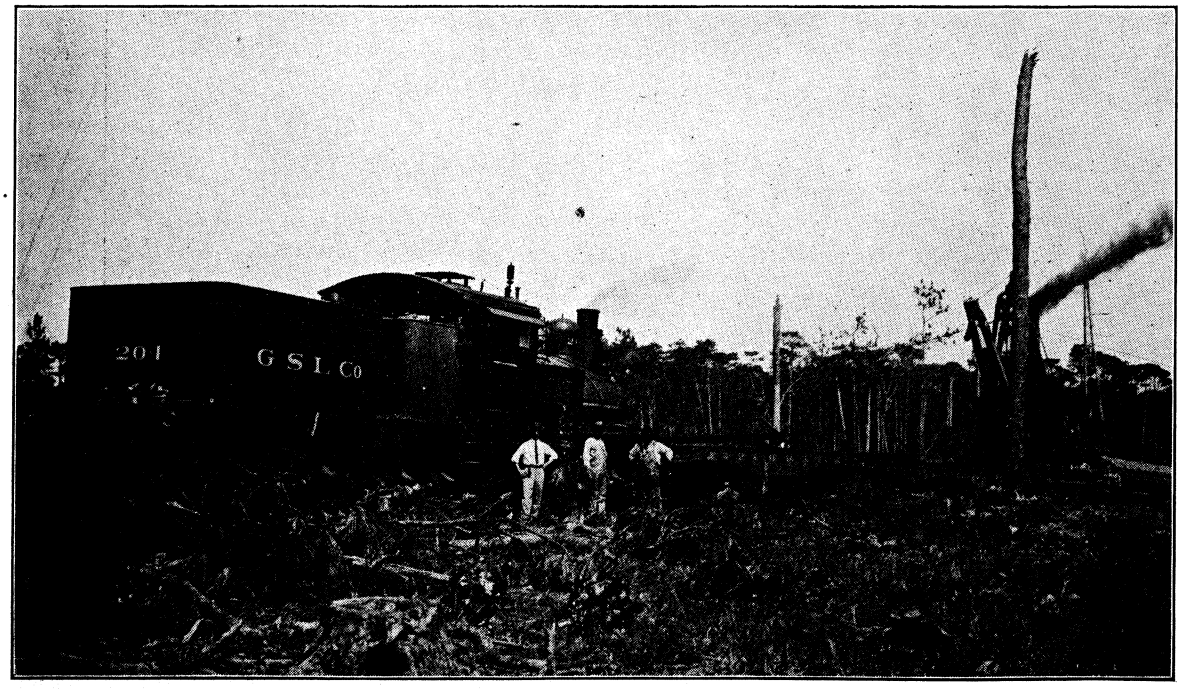
LOGGING RAILWAY, WEST SIDE LBR. CO., TUOLUMNE, CALIF., KNOWN AS HETCH-HETCHY & YOSEMITE VALLEY RY.



LOGGING RAILWAY, LAQUIN LUMBER CO., LAQUIN, PA.

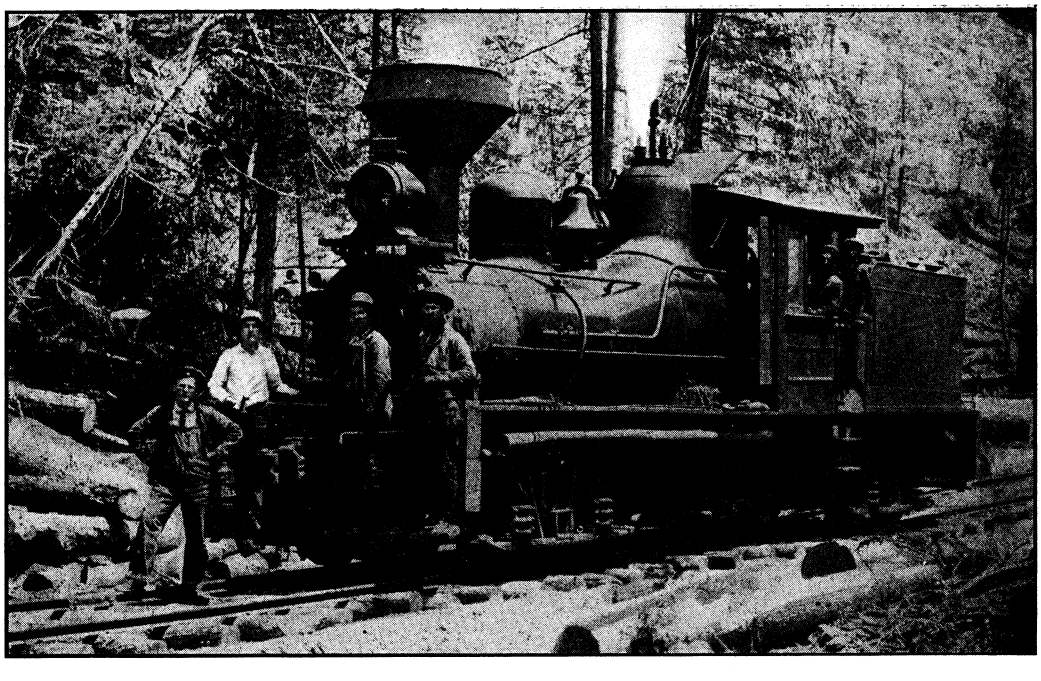


LOGGING RAILWAY, W. C. WOOD LUMBER CO., COLLINS, MISS.

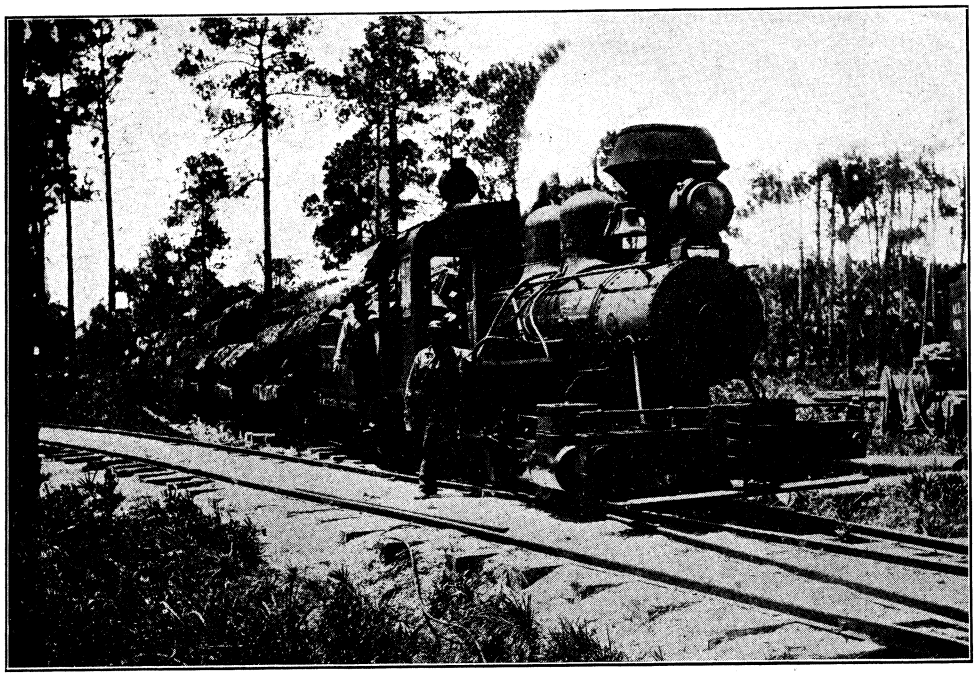


LOGGING RAILWAY, GREAT SOUTHERN LUMBER COMPANY, BOGULUSA, LA,

LOGGING RAILWAY, ALEX. GILMER LUMBER CO., REMLIG, TEXAS



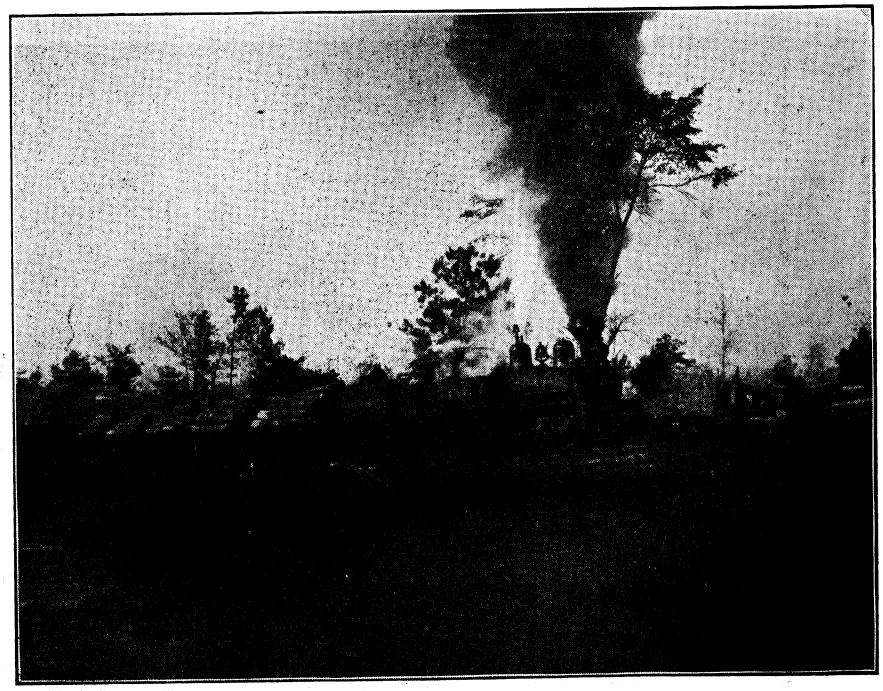
LOGGING RAILWAY, THORNTON LUMBER CO., DUNLEVIE, W. VA.



LOGGING RAILWAY, EVERGLADE CYPRESS LUMBER CO., LOUGHMAN, FLA.

as means of power to haul the cars of logs from the woods to the mills, were F. H. Goodyear, S. S. Bullis, G. D. Briggs, J. J. Newman, T. D. Collins, Wheeler & Dusenbury, E. Shay, J. & A. Kaul, C. B. Farr, Charles S. Horton, A. P. Perley, J. R. Droney, H. M. Loud & Sons and Butters Salt & Lumber Company.

The lumber production for 1909 amounted to 29,820,098,000 feet, and it is safe to say that nearly half of this lumber was cut and hauled out of the forest over logging railways. They are indispensable to modern logging and to the production of cheap lumber. At present there are over 1680 logging railways in the United States, aggregating 19,192 miles. On these logging railways there are over 3400 locomotives in service and 49,240 cars. The average length of each of these railways is from four to fifteen miles, but



LOGGING RAILWAY, J. J. NEWMAN LUMBER CO., HATTIESBURG, MISS.

LOGGING RAILWAY, CHERRY RIVER BOOM AND LUMBER CO., RICHWOOD, W. VA.

this length is constantly increasing as the timber becomes more and more remotely separated. In the earlier days it was the common practice to move the mills to the timber, but now it is just the reverse. Many sawmill towns have logging railways radiating in all directions up through the valleys and into the hills for distances from 2 to 50 miles. The majority of these roads are built standard gauge. The modern practice in laying out logging railways is to build a main line through the

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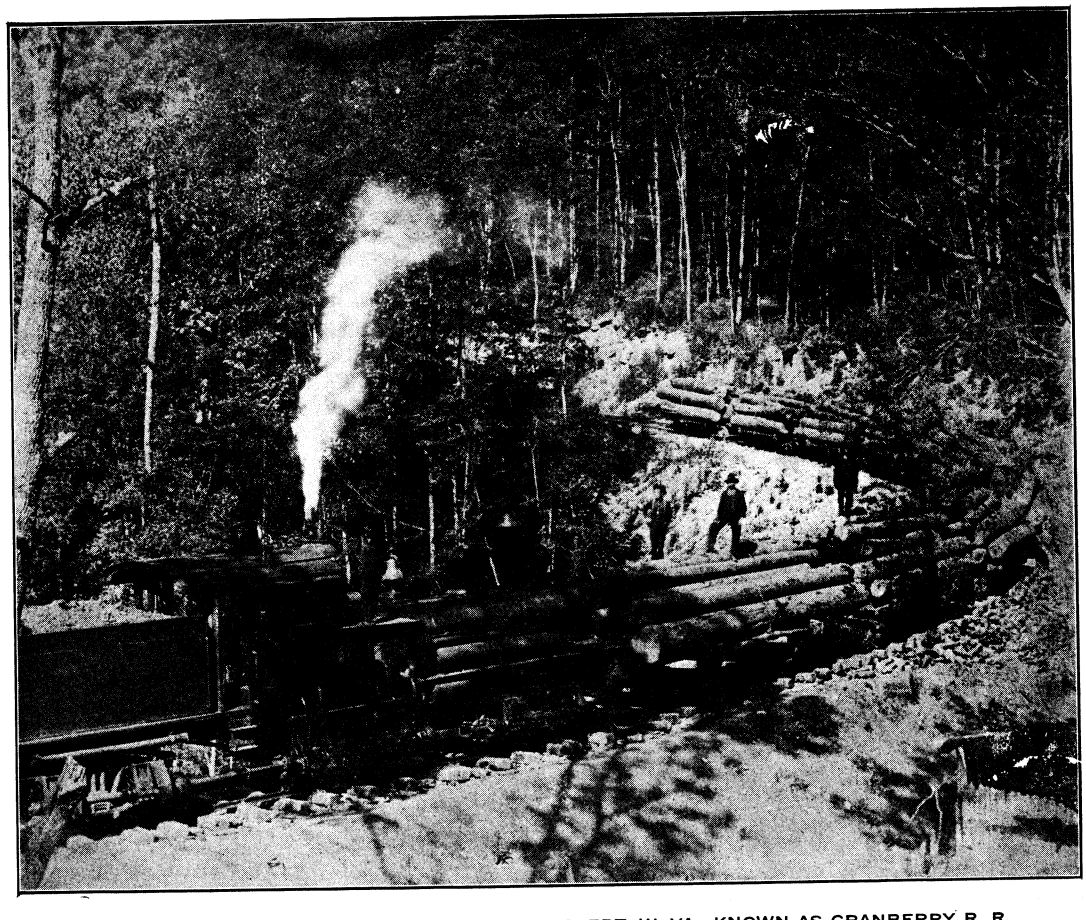

LOGGING RAILWAY OF WARN LUMBER CO., SEEBERT, W. VA., KNOWN AS CRANBERRY R. R.

THE BREAKAGE OF STAYBOLTS.

BY B. E. D. STAFFORD.

THE alternating stresses to which a staybolt is subjected in locomotive firebox service, demand a material with a tough fibrous structure. A good grade of charcoal iron, puddled, refined, reworked, and developed to the wrought bar under various methods of piling to obtain a strong center structure, produces a material which is the safest and most reliable for staybolt purposes. Staybolt breakage, however, is not a question of material so much as of construction. When rigidly stayed, the locomotive firebox affords but slight provision, if any, for the difference in the amount of expansion that naturally exists between the firebox and the wrapper, or outer sheet, of the boiler under varying temperatures of furnace operation. While the thin fire sheets, by distorting, bending, and buckling, accommodate to a certain extent the added stress due to the difference in the amount of expansion when rigidly stayed, the inevitable consequence is that the staybolt gives way under excessive stress, regardless of the material used, and the sheets gradually deteriorate, due to the continued bending and distortion.

The most important feature that has been demonstrated in connection with the method of staying the locomotive firebox, was recently brought to the notice of the railway world in a paper read before the New York Railway Club on May 20 of this year by D. R. MacBain on the subject of Inequality of Expansion in Locomotive Boilers and the Possibilities of Eliminating the Bad Effects Therefrom. For the purpose of practically demonstrating the theories on which earlier experiments were based with partial flexible and rigid staybolt installations, a high pressure locomotive was selected whose firebox was completely stayed with fiexible staybolts. It was placed in heavy passenger service, and the records and data which were obtained show clearly the advisability of giving careful attention not only to the use of the flexible stay, but also to the method of its application to render the firebox less liable to the effects of expansion. From the practical experience made, it was found by tramming the inside of the firebox sidesheet and the outer sheet when the boiler was cold, and comparing the measurements when the boiler was hot, that the difference of expansion of both sheets was too significant to be ignored.

To compensate for the difference in the amount of sheet expansion, adjustments were made in the application of the flexible staybolts by turning back the bolt head from its sleeve seat certain parts of a turn, before riveting over the firebox end of bolt. This was done in the outer rows of the side sheets, back head and throat sheet, the amount of release being varied according to the size of the firebox and the relative showing in the difference of sheet expansion. By so doing, it enabled the firebox and outer shell to expand under less restraint, and the staybolts to assume the load with less liability of being strained than under former practice of no adjustment. The results obtained proved satisfactory, the experiment and practice extending over a sufficient number of years to obtain comparative data and form reasonable conclusions, not only as to the life of the staybolts, but as to the condition of seams, rivets, side and flue sheets, all of which showed no perceptible indication of strain or distortion.

Further investigation by others not connected with but interested in the aforementioned experiment, disclosed the fact that when flexible staybolts were adjusted, especially in the throat sheets, to compensate for the longitudinal extension of the wrapper sheet over the firebox sheets, in instances where this method was applied to old fireboxes, when the staybolts were removed for firebox renewals it was discovered, by nicking and bending the iron in the bolt proper, that the material was as fibrous and as strong as when first incorporated. The bolt head showed a distinct bearing surface at the sleeve seat, demonstrating that under the adjustments made, it served its purpose as a stay, resisting the load due to pressure without becoming strained, and that the difference in the relative sheet expansion is largely compensated for by the adjustment which the flexible stay affords. Expansion of all heat absorbing parts in a locomotive firebox, if restricted, will affect the entire assemblage and prove disastrous to the weaker part of the construction.

The value of the difference in the amount of expansion between the firebox sheets and the roof or wrapper sheet has never been seriously considered to any extent until quite recently. It was supposed that most of the expansion was confined to the firebox proper while the relative amount of expansion between the wrapper and the firebox sheets, and the resultant effect therefrom on the complete construction was overlooked in most instances, as a vital point to consider in dealing with methods of staying.

The distortion of sheets has more or less lengthened the life of the rigid stay, while the sheets deteriorated by reason of continual bending. While the relative expansion of the outer shell and the firebox varies with each type of boiler, and is largely influenced by

methods of firebox and boiler operation, the difference in the amount of expansion is at times so great as to throw an excess strain on staybolts in the throat, back head and rigid corners of the side sheets. Regardless of sheet distortion, the bolts then assume a load too severe to withstand and are gradually rendered weak, and break.

The flexible staybolt has had much to contend with on points of cost compared with the rigid stay, and not until the question of economy of maintenance was earnestly considered, where ultimate costs determined the true value of a product based on service rendered could we point to any great advance in the use of the flexible stay, or the method of staying. Flexible staybolts found but little favor until within the last six years. The early designs were either too large or ungainly or too weak in sections to cope with firebox conditions. The two-piece bolt of the Johnston type made great headway as a simple and strong device to serve the purpose of a water space stay, but was soon declared obsolete by reason of the fact that inspection was impossible without removing the entire bolt. Incrustation in bad water sections rendered the connection rigid, cementing both the plug and the bolt intimately together.

The principle of the three-piece design for a flexible stay, was recognized as the most acceptable on which to base improvements and modifications soon led to shapes and sections involving the round head bolt. This affords greater shearing strength, and more readily releases itself under conditions of incrustation, than similar designs of the flat or sloping heads. The line of demarkation between serviceable and non-serviceable staybolts of the flexible type is determined largely on the merits which enable the bolt to operate under conditions of incrustation. The flaring mouth on the end of the sleeve of the round head bolt extending toward the water space serves to loosen and throw out all deposits which collect within the water space in adjusting itself to accommodate the relative sheet expansion under various temperatures.

The round head bolt design with its strong sections of bolt area, capped over with sufficient clearance between the cap and the bolt head to allow for suitable adjustment to the difference of sheet expansion, affording a ready means of inspection, with its several sizes of sleeves to suit the various angles and sheet contours of boiler design, adapted to take several diameters of bolt and affording interchangeability of parts, simple and economic in its application, forms an assemblage which readily establishes itself as an acceptable article of economic merit and serviceable value, and is fast proving the fact that flexible connections in firebox construction are absolutely needed.

The demand for flexible staybolts is due to the effort to curtail not only the resultant expense of staybolt renewals, but more largely to reduce the number of shoppings of engines for the purpose of renewing broken staybolts and repairing cracked fire sheets, which not only deprives the service of power, but contracts the earning value of each engine in direct proportion to the maintenance cost and the service rendered.

Essential to the economic solution of overcoming cost of maintenance in firebox repairs is the step that will first favor the construction of parts to more readily resist the stress of expansion without the strain of distortion, heretofore found so disastrous to all materials involved, and provide sufficient means to allow all heat absorbing surfaces to act under less restraint than that afforded by the complete system of rigid staying. Until locomotive boilers are measured to obtain the true amount of the difference of expansion from the cold to the hot state, and provisions are made to accommodate the relative amount of expansion between the wrapper sheet and firebox, the cause of staybolt breakage, fire sheet and flue sheet cracking, will remain an issue of misleading conclusions, if as in the past, quality of material forms the basis of solution, and the destructive forces due to the inequalities of expansion are ignored.

The flexible or adjustable staybolt so far has favored the theories of those who are mindful of the fact that steam boilers must breathe or expand under less restraint than that allowable with rigid staying. In the experiments and practical demonstrations made in the application and adjustment of the flexible staybolt to high pressure locomotives, covering, in many instances, years of constant service without staybolt breakage, side seams leaking, and sheets cracking, and obtaining a great reduction of breakages in most cases, the value of the service rendered compared to the cost of repairs is a unit of economic comparison, which not only credits the flexible staybolt as being superior to the rigid stay in localities of greatest sheet expansion, but also points conclusively to the advantage gained in the judicious use of the flexible or adjustable staybolt as a compensating medium of great utility in affording sufficient flexibility to the firebox construction, enabling such to more safely cope with the alternating stresses due to expansion.

The general recognition given to the flexible staybolt in late years, as an article of

(Continued on Page 14.)

PROPOSED RULES FOR INSPECTION AND CARE OF LOCOMOTIVE BOILERS.

(Reprint from Railway Journal.)

THE new federal law governing the inspection of locomotive boilers, which goes into effect on July 1, requires every road doing an interstate business, to file a report of their rules for the inspection of locomotive boilers. It is the purpose of the railway managements to make these rules as uniform as possible. The American Railway Master Mechanics' Association has drafted and adopted a form of proposed rules to use as a basis for all roads in preparing their individual rules. It is not expected that this draft will be adhered to strictly, but that it will assist in keeping that uniformity of rules desired for the benefit of the roads, and to simplify the inspection of locomotive boilers. The following are the proposed rules as adopted by this association:

I.
RESPONSIBILITY

The.....will be held responsible for the inspection of the boilers of all locomotives assigned to the division or district.

II.
INSPECTION OF INTERIOR OF BOILER.

(a) TIME OF INSPECTION—The interior of every boiler shall be thoroughly inspected before the boiler is put into service, and also whenever a sufficient number of flues are removed to allow an examination.

(b) METHOD OF INSPECTION—The entire interior of the boiler must then be examined for cracks, pitting and grooving. The edges of plates, all laps, seams and points where cracks and defects are likely to develop, or which an exterior examination may have indicated, must be given an especially minute examination and reports made of condition found. It must be seen that braces and stays are taut, that pins are properly secured in place, and that each is in condition to support its proportion of the stress.

(c) REPAIRS—Any boiler developing cracks in the shell which will impair the safety of the boiler shall be taken out of service at once and repaired before it is returned to service.

(d) LAP JOINT SEAMS—Every boiler shell having lap joint longitudinal seams without reinforcing plates shall be examined with especial care to detect grooving or cracks at the edges of the seams.

III.
INSPECTION OF INTERIOR OF BOILER.

The jacket and lagging shall be removed to permit inspection of the exterior of the boiler whenever the firebox is renewed or whenever the inspector considers it desirable or necessary in order to thoroughly inspect the boiler.

IV.
TESTING OF BOILERS.

(a) TIME OF TESTING—Every boiler before being put into service and at least once every twelve months thereafter shall be subjected to hydrostatic pressure of 25 per cent above the working steam pressure.

Water must be heated immediately before pressure is applied.

(b) REMOVAL OF DOME-CAP—Preceding the hydrostatic test the dome-cap must be removed and the interior surface and connections of the boiler examined as thoroughly as the conditions permit.

(c) WITNESS OF TEST—When the test is being made authorized representatives familiar with boiler construction must personally witness the test and thoroughly examine the boiler while under test.

(d) REPAIRS AND STEAM TEST—When all necessary repairs have been completed, the boiler shall be fired up and the steam pressure raised to not less than the allowed working pressure and carefully examined. Any defects discovered must be remedied.

(e) ALLOWED STEAM PRESSURE—A badge plate showing the allowed steam pressure should be mounted in the cab of each locomotive, preferably located on the boiler head or steam gauge bracket.

(f) REPORTS—A record of each hydrostatic test must be made on the blank provided for the purpose and each item on the blank to be filled in and the reports signed by the authorized representatives witnessing the test.

V.
STAYBOLT TESTING.

(a) TIME OF TESTING RIGID BOLTS—The rigid staybolts of all locomotives in service must be tested not less frequently than once each month. The rigid staybolts must also be tested immediately after each hydrostatic test.

(b) METHOD OF TESTING RIGID BOLTS—The inspector must tap each bolt accessible from the firebox side, and those not thus accessible must be tapped whenever possible on the outside end, and judge from the sound or vibration of the sheet which of them are broken.

When staybolts having telltale holes are used, those visible must, in addition to the hammer test, be carefully inspected to insure that all of the telltale holes are open, using a drill for this purpose when neccessary.

(c) METHOD OF TESTING FLEXIBLE STAYBOLTS—Flexible staybolts must undergo a special examination not less frequently than once each eighteen months by removing a number of the caps in different locations, for examination of sleeves and bolts, preferably while locomotives are in shop for general repairs, and prior to hydrostatic tests.

(d) BROKEN STAYBOLTS—No boiler must be allowed to remain in service when there are one or more staybolts broken in the top row of firebox, nor two or more adjacent broken or plugged staybolts in any part of the firebox, nor three or more broken or plugged staybolts in a circle four feet in diameter, nor when five or more staybolts are broken in the entire boiler

(e) RECORDING OF TEST—The staybolt inspector must keep an accurate record of the location of each imperfect bolt, marking it on the blank provided for that purpose and forward same to.....

VI.
STEAM GAUGES.

(a) TIME OF TESTING—Steam gauges should be tested not less frequently than once every three months, and also when any irregularity is reported. Gauges found inaccurate must be corrected before being put into service.

(b) Record should be kept of all gauges tested.

VII.
SAFETY VALVES.

(a) SETTING OF VALVES—Safety valves shall be set by the gauge employed upon the boiler to pop at pressure not exceeding 5 per cent above the allowed steam pressure, the gauge in all cases to be tested before the safety valves are set or any changes made in the setting.

VIII.
WATER GLASS AND GAUGE COCKS.

(a) TIME OF CLEANING—All gauge cocks and

water glass cocks shall be tested and cleaned of scale and sediment whenever boiler is washed.

IX.

PLUGS IN FIRE TUBES.

(a) PLUGS PROHIBITED—No boiler shall remain in service which has one or more fire tubes plugged at both ends of the tube, unless the plugs are securely tied together by means of a rod not less than ⅝-inch diameter.

X.

WASHING BOILERS.

(a) TIME OF WASHING—All boilers in service shall be thoroughly washed not less frequently than once in thirty days.

(b) WATER TUBES—Special attention must be given the arch and water bar tubes to see that they are free from scale and sediment.

(c) OFFICE RECORD—A record of all locomotive boiler washouts shall be kept in the office of the railroad company.

RAILWAYS AND INTERSTATE COMMERCE DECISION.

With months of exhaustive inquiry and voluminous investigation of the question of increased freight rates the Interstate Commerce Commission has unanimously reported against the transportation lines, thus clearing the situation of the doubt which has involved the issue since the matter has engrossed public attention. With the stupendous interests held in abeyance until a decision could be reached there has been felt a decided relief now that a conclusion has been arrived at. The substantial indorsement of the position assumed by the shippers that the railroads of the country had not made out a case leaves no hope for change or amendment of the commission's declaration and all relief for expected increased income must be supplied in greater economies which those conducting the country's railroad service may be able to introduce.

The opinion is general that those controlling the transportation lines have for a considerable time anticipated the decision of the Interstate Commission and in a number of particulars discounted its effect on certain proposed improvements and extensions. While but a brief time has elapsed since the decision was given to the public yet sufficient time has passed to show that no serious effect has been produced on railroad securities or that enterprises having a substantial foundation will be crippled to any appreciable extent. This is something which appealed with special force to the construction world and whose interests were affected by the uncertain outcome perhaps more than all others combined.

For more than a generation there has been a test of strength and endurance between the transportation lines of the country and the determination of the public as to which side would control, a study of the varied chapters showing that in the progress of years the people have gained the upper hand. It is hoped that the last lesson will not be lost sight of and that those responsible for the tremendous interests represented by the railroads will recognize the fact that control of public utilities—natural monopolies—must rest in the hands of the power which gave the life to these corporations.

It is to be regretted that corporations which control so many millions and wield so intimate an influence on general welfare cannot see their obligation or perform their duty to the public except as they are forced to do so by the mandate of the court.—*Steam Shovel Magazine.*

THE BREAKAGE OF STAYBOLTS.

(Continued from Page 12.)

economic use and of practical utility, and to the methods of its application and adjustments necessary in the rigid localities of greatest sheet expansion to relieve the bolt of excess tension; the judicious layout in the effort to fully cover the breaking zone according to each type of firebox, and to minimize the effects of the alternating stresses so disastrous to staybolts—all features of vital importance —have to the extent of the consideration given and the practice followed, accomplished much to advance the general proposition of eliminating staybolt breakage and fire sheets cracking, inasmuch as the cause of breakage is traced to its true source.—*Railway Age Gazette.*

THE LOGGING RAILWAY.

(Continued from Page 9.)

tract of timber which is to be logged, locating it to the best advantage with reference to the topography of the country and the distribution of the timber. From the main line spurs are built extending on either side to all parts of the timber. There has been a gradual but decided improvement in the location of the main lines. Some of the older roads were very rough and crooked and grades of 15 per cent were not unusual. However, the grades on the main lines at present vary from 4 per cent up to 8 per cent. All weights of rails are used varying up from 30 lbs. to 70 lbs. The standard for main line roads, may be considered as 60 lbs. We are pleased to present herein views of logging railways in various parts of the United States. These views will give a clear idea of the character of the construction.

Some few of the roads have outgrown their first uses and have become common carriers. The economic value of the logging railway is gradually increasing, and it is safe to say that many of these lines will finally become feeders for the trunk lines and prove to be permanent assets to the country.

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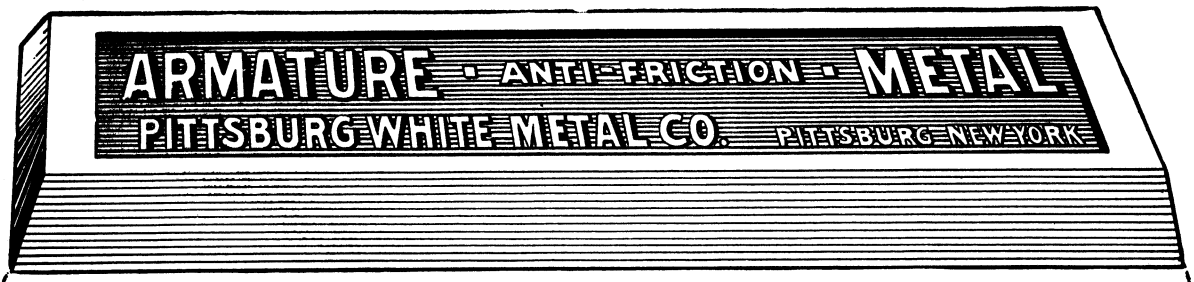

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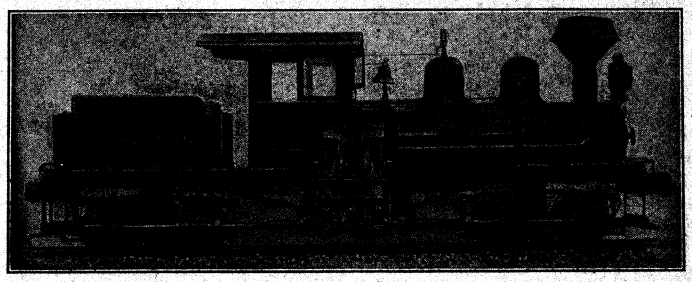

A PARTIAL LIST

	TONAGE	TYPE	GAUGE	LOCATION	REFERENCE NO
1	13	Shay	56½"	Georgia	0829
1	15	Shay	42 "	Mississippi	0810
1	15	Shay	56½"	South Carolina	0818
1	17	Shay	56½"	South Carolina	0819
1	18	Shay	56½"	Florida	110
1	18	Shay	36 "	Tennessee	086
1	28	Shay	56½"	Arkansas	0828
1	30	Shay	36 "	New York	101
1	33	Shay	56½"	West Virginia	0825
1	33	Shay	56½"	New York	111
1	37	Shay	56½"	Michigan	0826
1	42	Shay	56½"	Mississippi	103
1	55	Shay	56½"	New Mexico	0832
1	65	Shay	56½"	New Mexico	083
1	65	Shay	56½"	New Mexico	0831
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